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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

LUU, THANH X

ART UNIT PAPER NUMBER

2878

DATE MAILED: 03/18/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/654,550

Applicant(s)

IWASA, YOSHIRO

Examiner

Thanh X Luu

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 September 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the convex shape of the optical receiving element of claim 11 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Specification***

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### ***Claim Objections***

3. Claims 5 and 6 are objected to because of the following informalities:

In claim 5, "the semiconductor chip" lacks proper antecedent basis. It is unclear which semiconductor chip is referred to.

In claim 6, line 5, "the signal" lacks proper antecedent basis.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 5, it is unclear in its given context how one optical signal is transferred among a plurality of semiconductor chips when only one light-receiving element and one optical transfer device is claimed.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 2, 4-6, 8 and 10, as understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Reid et al. (U.S. Patent 5,009,476).

Regarding claims 1, 2 and 4, Reid et al. disclose (see Figures 1, 3 and 4) a semiconductor device comprising: a semiconductor chip (3) and a light-receiving element (11) formed in the semiconductor chip for receiving an optical signal; and an optical signal transfer device (5) connected to the light-receiving element for transferring the optical signal into the semiconductor chip. Reid et al. further disclose (see Figures) the optical transfer device is an optical fiber and the chip is mounted on a mounting substrate (1).

Regarding claim 5, Reid et al. disclose (see Figures 1, 3, 4 and 5) a semiconductor device comprising: a mounting substrate (1) and an optical signal

transfer device (5) disposed in the mounting substrate for transferring optical signals; a plurality of semiconductor chips (3) mounted on the mounting substrate; and a light-receiving element (11) formed in one of the chips connected to the optical signal transfer device for receiving the optical signal; wherein optical signals are transferred among the chips through optical transfer devices.

Regarding claims 6, 8 and 10, Reid et al. disclose (see Figures 1, 3 and 4) a semiconductor device comprising: a semiconductor chip (3) and a light-receiving element (11) formed on the chip for receiving an optical signal; and an optical signal transfer device (5) connected to the light-receiving element for transferring a signal from an arithmetic processing apparatus (another chip) as the optical signal into the chip. That is, another chip internal or external to the substrate inherently performs arithmetic processing. Reid et al. further disclose (see Figures) the optical transfer device is provided in a mounting substrate (1) on which the chip is mounted and (see Figures 1 and 5) the optical transfer device is formed in a lattice configuration.

8. Claims 1-4, as understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Horwitz et al. (U.S. Patent 5,371,822).

Regarding claims 1-4, Horwitz et al. disclose (see Figure 2) a semiconductor device comprising: a semiconductor chip (26) and a light-receiving element (28) formed in the semiconductor chip for receiving an optical signal; and an optical signal transfer device (30) connected to the light-receiving element for transferring the optical signal into the semiconductor chip. Horwitz et al. further disclose (see Figure 2) the optical transfer device is an optical fiber and the chip is mounted on a mounting substrate (14)

and a package (14, 16) that seals the chip and a part of the fiber.

9. Claims 6-9, as understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Soichi (JP Publication 07-131063).

Regarding claims 6-9, Soichi discloses (see Figure 1) a semiconductor device comprising: a semiconductor chip (13) and a light-receiving element (101) formed on the chip for receiving an optical signal; and an optical signal transfer device (19) connected to the light-receiving element for transferring a signal from an arithmetic processing apparatus (not shown) as the optical signal into the chip. That is, another chip internal or external to the substrate inherently performs arithmetic processing. Soichi further discloses (see Figure) the optical transfer device is provided in a mounting substrate (11) on which the chip is mounted and the optical signal is a clock signal. Soichi also discloses (see Figure 1) the signal transfer device is a light-emitting surface or element (19) that is formed in the mounting substrate.

***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Reid et al. or Soichi.

Regarding claim 11, Reid et al. and Soichi do not specifically disclose the shape of the light-receiving element and the insertion configuration as claimed. However, it

would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a convex shape in the apparatus of Reid et al. or Soichi to improve detection by converging light with a convex shape as well known. Furthermore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide an insertion contact between the light-receiving element and the optical signal transfer device in order to ensure a tight and secure connection between the two elements.


### ***Conclusion***

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh X. Luu whose telephone number is (703) 305-0539. The examiner can normally be reached on Monday-Friday from 6:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seungsook Ham, can be reached on (703) 308-4090. The fax phone number for the organization where the application or proceeding is assigned is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

txl  
March 7, 2002

  
Que T. Le  
Primary Examiner